Hide and Seek: Does the TBI Allow for Earlier Recognition of PAD in Diabetic Patients?

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Introduction: It is assumed that in diabetic patients, calcification of the ankle arteries may cause unreliable measurement of the ankle-brachial index (ABI). Clinical guidelines recommend the toe-brachial index (TBI) as an alternative in diabetic patients with 'falsely elevated' ankle pressures, arbitrarily defined as an ABI >1.4. Considering that arterial calcification is also common among diabetics with an ABI <1.4, and may thus result in a 'falsely normal' ABI and subsequent under-diagnosis of PAD. We investigated whether diabetics have a lower TBI at similar ABI as compared to non-diabetics, and if the TBI may enable earlier detection of PAD in diabetics.

Methods: We randomly selected 326 diabetic and non-diabetic patients (512 legs) with suspected PAD from our vascular lab registry. Mean difference between ABI and TBI was compared for diabetics and non-diabetics. In addition, a Bland-Altman plot was constructed with 95% limits of agreement established from non-diabetics. Separate analyses were performed including only patients with Fontaine stages 2 or 3, or an ABI within the normal reference range (0.91—1.4).

Results: Diabetic and non-diabetic patients were similar with regard to age and sex distribution. Median ABI did not differ between both groups (Table 1). Median TBI was higher in diabetics, but overall the difference between ABI and TBI was similar. Remarkably, in patients with Fontaine 2 or 3, mean difference between ABI and TBI was larger for non-diabetics (mean difference -0.11, 95% CI -0.20 to -0.03; $p = 0.008$). Among patients with a normal ABI, both the TBI and the difference between ABI and TBI were similar for diabetics and non-diabetics (Table 1). The difference between ABI and TBI for diabetics overlapped the reference range established from non-diabetics, independent of the magnitude of the measurements (Figure 1).

Conclusion: We found no indication that the TBI may enable earlier detection of PAD in diabetics. The TBI and ABI are strongly correlated, and this relation is not influenced by the presence of diabetes. In patients with Fontaine 2 or 3, TBIs were actually lower in non-diabetics at similar ABIs. As such, initial assessment of the TBI in diabetics, compared to non-diabetics, generally does not yield additional information if the ABI is not obviously elevated.

The Role of Transcranial Doppler Ultrasound in the Management of Patients with Carotid Disease: A Meta-analysis

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Introduction: Carotid endarterectomy (CEA) is a well-established surgical treatment for symptomatic carotid disease. The number of CEA procedures being performed is rapidly increasing. Current methodology of identifying patients is based on stenosis of the carotid artery which suffers methodological and conceptual problems meaning patient identification is suboptimal. Adjuvant markers of stroke risk could therefore provide clinical benefit to patients. Microembolic signals (MES) in the middle cerebral artery (MCA) reported by transcranial Doppler ultrasound (TCD) is a potential marker however its predictive role in stroke is yet to be firmly established.

Methods: A search strategy was performed searching Medline (PubMed), Embase and The Cochrane Database for all relevant studies.

A meta-analysis of all prospective studies reporting data on MES recorded by TCD was performed using stroke and transient ischaemic attack (TIA) or stroke alone as outcomes. Any data on temporal bone window availability found in selected papers was also extracted.

Two review authors selected relevant papers. The metan command in Stata was utilised to analyse extracted data with a random effects model and Mantel-Henzel weights. Odds ratios with 95% confidence intervals (CI) were calculated. Information was separated by endpoint, either stroke and TIA or stroke alone. Each outcome was stratified by patient groups including: asymptomatic, symptomatic, perioperative dissection, perioperative cross clamp release and postoperative. High rates of MES were also investigated.

Results: Of the 2850 papers identified by the search 25 provided data for analysis including 4483 individuals. For stroke or TIA as the endpoint MES were predictive in asymptomatic (OR 7.80 CI 2.73, 22.33), symptomatic (OR 8.21 CI 4.24, 15.90), perioperative dissection (OR 4.61 CI 1.15, 18.59) and postoperative patients (OR 4.03 CI 1.56, 10.45). For stroke alone MES were predictive in asymptomatic (OR 8.54 CI 4.35, 16.75) and symptomatic patients (OR 7.45 CI 1.89, 29.31). High MES counts were predictive of stroke or TIA in the perioperative dissection phase (OR 17.05 CI 6.1, 47.68) and postoperative period (OR 20.37 CI 5.54, 74.9). A temporal bone window was found to be present in 89.7% of 2190 patients.

Conclusion: TCD can be widely used to predict stroke risk in patients with carotid disease by detection of microemboli. Utilisation may enable superior patient identification and assessment if correctly implemented. TCD seems to be of more value perioperatively and postoperatively when high microemboli counts are considered.

Postoperative and Long-term Results of Total Laparoscopic Versus Conventional Aortic Bypass Surgery: A Propensity Analysis

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Introduction: This prospective study was designed to analyse the postoperative and long-term outcomes of total laparoscopic vs. open surgical repair of infra-renal aortic occlusive disease (AOD) and infra-renal aortic aneurysmal disease (AAA) in comparable groups of patients using propensity analysis.

Methods: From January 2006 to January 2010, 228 consecutive patients who received an aortic bypass for AAA ($n = 139$) or for AOD ($n = 89$) were studied. Open repair was performed in145 patients (AAA $= 109$, AOD $= 36$) and total laparoscopic repair in 83 patients (AAA $= 30$, AOD $= 53$). One-to-one propensity score matching between study groups was done according to a difference in the logit of propensity score of less than 0.04 between each of the patient pairs in the study groups. Logistic regression with the help of backward selection was used to adjust the effect of treatment method for propensity score as well as other variables in evaluating postoperative and long-term outcome. A p value $<.05$ was considered statistically significant.

Results: When treatment method was adjusted for one-to-one propensity score, matching resulted in 59 pairs with similar preoperative characteristics as indicated by univariate analysis. Laparoscopic aortic repair was associated with a significantly

higher risk of composite postoperative adverse events (bypass occlusion, bleeding, graft infection, reintervention) compared with open repair (OR 6.5, 95%CI 2.7–15.5, $p < .0001$). Adjusted analysis for propensity score, showed also that postoperative mortality risk tended to be higher after laparoscopic repair (OR 8.5, 95%CI 0.7–99.3, $p = .09$), but this difference did not reach statistical significance.

Hospital stay was significantly shorter after laparoscopic surgery. Laparoscopic repair was also associated with a significantly higher risk of late composite adverse event ($p < .001$). This was likely due to a significantly higher risk of late reintervention after laparoscopic repair ($p < .01$). No other marked differences were observed in the other outcome end-points. The small number of patients with abdominal aortic aneurysm as well as the lack of any difference in terms of composite adverse end-point after laparoscopic repair in either conditions (abdominal aortic aneurysm 29.0% vs. aortoiliac disease 26.4%, $p = 0.80$) prevented sensitivity analysis in these subgroups of patients.

Conclusion: This study suggests that even for a trained laparoscopic vascular surgeon, the technical challenge of laparoscopic aortic surgery has a negative impact on the early postoperative period and on the late course of the patients.

Durability of TEVAR in Blunt Traumatic Thoracic Aortic Injury – Long-term Experience from Two Tertiary Referral Centres

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Introduction: Blunt traumatic thoracic aortic injury is a life-threatening condition, the second most common cause of death from blunt trauma after head injury. The advent of TEVAR has revolutionised the management of these patients, and with the use hybrid operating theatres, it is now possible to treat several injured organ systems in the same environment. Early outcome after TEVAR for blunt aortic injury (BAI) is excellent, but long-term data is scarce. The aim of the present study was to analyse long-term outcome of TEVAR for BAI by merging data from two European tertiary referral centres.

Methods: All patients undergoing TEVAR for BAI at the two centres were registered prospectively during the period 2001–2010. In one centre, 17 patients were treated, and in the second one 29. Data on mechanism of injury, concomitant injuries, intra-operative variables, need of subsequent re-intervention and survival was documented. All patients were followed-up in 2013; in one centre on Aug 31st, 2013. In the second centre, follow-up was undertaken continuously during 2013.

Results: Of the 46 patients, there were eight women (17%). Median age was 42 years (range, 18–85 years). Twenty-nine patients were injured in motor vehicle accidents, ten had fallen from heights, and three were involved in crush injuries. Miscellaneous causes lay behind the four remaining cases. All patients had concomitant injuries. The median injury severity score (ISS) was 43 (range, 25–75). Early (30-day) mortality was 13% (6 of 46 patients), whereas in-hospital mortality was 17% (8 of 46), as two patients died of brain injury and multiple organ failure, respectively, during the primary hospitalisation. After a median follow-up of 6.1 years (range, 0–12.2 years), seven patients (15%) underwent re-intervention, all of them within the first post-operative year. Four patients underwent re-lining of the stentgraft, one of them with subsequent carotid-subclavian bypass, two patients were operated upon with carotid-subclavian bypass with no additional procedure, and one patient underwent explantation of the stentgraft. Five- and ten-year survival, respectively, was 85% (Fig. 1).

Conclusion: TEVAR allows rapid and safe therapy in patients with BAI. Re-intervention is needed in roughly one in six patients during the first year, but after that it is very uncommon. Long-term survival in these patients is excellent. The initial outcome is highly dependent on the severity of other injuries.

Operative Results and Clinical Features of Chronic Stanford Type B Aortic Dissection: The Examination of 234 Patients in Six Years

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Introduction: Recently, a technology of thoracic endovascular aortic repair (TEVAR) has been developed. However, TEVAR for Stanford type B aortic dissection (TBAD) is still controversial. The benefit of TEVAR for acute TBAD is unclear, and TEVAR for chronic TBAD has morphological limitations and a probability of re-intervention. Therefore conservative treatment in acute phase and open surgery in chronic phase are golden standard even now. We examined our result of open surgery for chronic TBAD, and the clinical features of them.

Methods: From January 2008 and September 2013, 234 patients underwent open surgery for chronic TBAD in our service. Our basic strategy was open surgery using left heart bypass. Operative indication was exceeding 50 mm of maximum diameter or rapid enlargement over 5 mm within 6 months.

Results: In 180 cases, false lumen (FL) was patent. Mean term from onset of TBAD to operation was 64.5 ± 55.8 months. There was no significant difference between patent FL group and thrombosed FL group ($p = 0.44$). Mean ratio of FL diameter to maximum aortic diameter (FL/AD) was 0.64 ± 0.21. There was no correlation between FL/AD and the term before the operation (Correlation coefficient: 0.12). Descending thoracic aortic replacement was performed in 127 cases and thoracoabdominal aortic replacement in 107 cases. The overall operative mortality was 6.8%: 4.6% (10/216) in elective operations and 33.3% (6/18) in non-elective operations. 1-year and 3-years survivals were 87.6% and 86.7%. Re-intervention free rate was 97.0%.

Conclusion: The enlargement of uncomplicated TBAD in chronic phase had less relation with the morphology of FL, and our open repair had acceptable early outcomes and low re-intervention rate. And there were less morphological limitations. These results should be sufficiently considered in the treatment of TBAD. But further prospective study for TBAD is necessary.

The Importance of Angiosome Concept on Ulcer Healing: Percutaneous Transluminal Angioplasty vs. Surgical Bypass in Bellow the Knee Arteries

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Introduction: Angiosome concept has enabled a fresh look at revascularization in patients with CLI and foot ulcer, entailing a selective revascularization of the specific artery feeding the area